



COLONY OF MAURITIUS

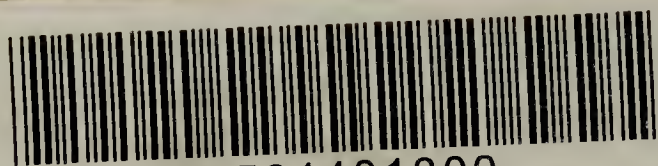


Annual Report
on the
Medical and Health Department
1947

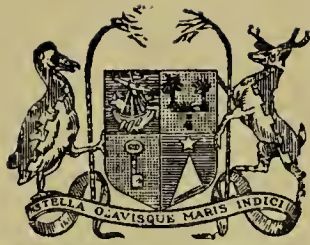
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J. ELIEL FELIX, GOVERNMENT PRINTER,
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Annual Report on the Medical and Health Department, 1947

General

In 1940, His Majesty's Government published its proposals for the progressive development of the Colonial Empire and these were enacted in the Colonial Development and Welfare Act, 1945. The succeeding years in Mauritius were devoted to planning for the future, and in 1946, His Excellency the Governor placed before the Council of Government a ten-year programme of development which having been adopted, was finally approved by the Secretary of State in February, 1947. Priority in the plan was given to schemes designed to increase productive capacity since upon this depends the revenue of the Colony without which no continuing development can be achieved, and next came the Health Services, the proposals for which followed closely the recommendations made in a Report on Health Conditions in Mauritius published in 1944. The principles of that Report, which was subjected to most careful and critical scrutiny by the Council of Government, were accepted and form the basis of the Health Development programme. Whilst this is still in the embryonic stage, a considerable amount of progress has been made during the past three years and, with a view to indicating what has been accomplished, this report is arranged more or less on the form of that adopted in the report of 1944 to which reference has just been made.

I.—Administration

Difficulties in recruitment have prevented the strengthening of the administrative staff, and the result has been a continuance of the practice of employing the services of the Medical Officer of Health of Port Louis on the Headquarters Staff to the detriment of the sanitary condition of that town.

2. Following upon the appointment in 1945 of a Medical Officer of Health for the district of Plaines Wilhems, it has been possible to make a start on decentralisation of administrative business, and all health matters pertaining to that district not involving questions of policy are dealt with by the Medical Officer of Health who is in regular touch with the Boards of the three Townships in Plaines Wilhems, his relationship being that of adviser on health matters. This direct liaison between the department and the Boards has already proved its value in a marked improvement in the sanitary condition in two of these townships and a similar improvement may be expected in the third.

3. Other appointments made are indicated under the respective sections of this report. Certain of them should be mentioned at this stage—

- (a) An Engineer has been appointed to carry out the various works designed to control malaria and to supervise maintenance.
- (b) A Medical Officer has been appointed by the Department of Education to the Teachers Training College. His duties include those of a School Medical Officer and he works in close cooperation with the Nutrition Officer and with the Health Department.
- (c) The duties of the Nutrition Officer, who is attached to the Health Department, include food surveys, training of personnel, advising in matters relating to diets in institutions, feeding of school children and nutritional questions in general.
- (d) The appointment of an Orthopaedic Surgeon in 1946 has enabled the department to institute an orthopaedic centre and orthopaedic clinics in the principal hospitals.
- (e) The appointment of a Superintendent of Midwives has made it possible to prepare a scheme for the training of midwives and supervision of the practice of midwifery in the Colony. The necessary legislation is being drafted.

4. Dr. L. R. du Vergé, O.B.E., Medical Superintendent of Victoria Hospital, who acted as Director of the Department during 1947, resumed his substantive post on the return from vacation leave of Dr. A. Rankine on 5th November, 1947.

The following officers assumed duty on first appointment on the dates shown—

Dr. Ng Chhung Hin, Pathologist, 10th February.

Dr. G. Domaingue, Medical Officer, 28th June.

Mr. F. T. Key, Senior Health Inspector, 2nd August.

Miss C. A. Nicholson, Nursing Sister, 21st March.

Miss A. Macpherson, Superintendent of Midwives, 3rd August.

The following officers proceeded on vacation leave during the year—

Dr. W. R. Dupré, Radiologist, 30.3.47.

Dr. Roger Pilot, Government Medical Officer, Moka, 4th July.

Dr. H. D. Tonking, Senior Pathologist, 8th August.

Dr. M. Shun Shin, Medical Officer, Civil Hospital, 10th September.

Dr. X. Letellier, Medical Officer, Civil Hospital, 9th October.

FINANCIAL

5. The revenue of the Colony for the financial year 1946-47 was Rs. 50,511,566 of which Rs. 144,096 was received through the Medical and Health Department. The expenditure on medical and health services was Rs. 2,611,795 or 5.2 per cent. of the total expenditure for the year. This represents a sum of six rupees and four cents per head of the population.

Under the Development and Welfare Scheme, the revenue was Rs. 5,334 and the expenditure Rs. 378,478.

LEGAL

6. The following legislation was passed—

Ordinance No 24 of 1947.—amending Ordinance No. 14 of 1925 as subsequently amended by Ordinance No. 38 of 1927—cited as the Notification of Births (Amendment) Ordinance 1947. To provide for notifications of births to be made at Dispensaries and Sanitary Offices instead of at Police Stations as was originally provided.

Ordinance No. 50 of 1947.—cited as the Poisons (Safekeeping by traders) Ordinance, 1947. To provide for the safe keeping of poisons used in trades and industries.

Government Notice No. 5.—cited as the Defence (Conservation of Supplies of Drugs) Regulations, 1943, Revocation Order, 1947. To revoke Government Notice No. 374 of 1943 as subsequently amended, which imposed control of sale of antimalarial drugs.

Government Notice No. 92.—Regulations made under Article 51 of the Quarantine Consolidation Ordinance, 1913—(Flat Island to cease to be a Quarantine Station).

Government Notice No. 214.—Regulations made by the Director of the Medical and Health Department under Article 7 of the Pharmacy Ordinance 1912, permitting the sale by traders of certain additional simple medicines.

Government Notice No. 261.—Rules for Nursing Students in Public Hospitals published under Government Notice No. 25 of 1934, as subsequently amended.

General Notice No. 125.—Made under Article 161 of the Public Health Ordinance 1925, to appoint a private Cemetery at Amaury, in the district of Riviere du Rempart.

General Notice No. 165.—To confirm Government Notice No. 227 of 1946. (Regulations made under the Public Health Ordinance, 1925). This transfers the maintenance of public cemeteries to the Public Works Department.

General Notice No. 202.—Regulations made by the Director of the Medical and Health Department, under Articles 155 and 193 of the Public Health Ordinance, 1925, as subsequently amended. These provide for free treatment of Government employees and their families as outpatients at Government Hospitals and for reduced charges as in-patients.

General Notice No. 815.—Made under Article 161 of the Public Health Ordinance, 1925, to appoint a private Cemetery at Chemin Grenier, in the district of Savane.

II.—Laboratory Services

7. The Central Laboratory is situated at Réduit, but in accordance with the policy of decentralising, two branch laboratories have been established in the Civil Hospital at Port Louis and in the Victoria Hospital at Candos. The instant success with which these met and the

large measure in which they are used by medical practitioners were described in the Annual Report of the Senior Pathologist for 1946 and evidence of their value continued to accumulate during the year under review.

The total number of examinations made in these branch laboratories was 13,460 classified as under—

Medical Biological	...	...	...	...	7,983
Bacteriological	...	...	...	...	1,927
Haematological	...	...	...	...	1,285
Biochemical	...	...	...	...	2,255
Miscellaneous	...	...	...	...	10

The branch laboratories are staffed by trained technicians from the Central Laboratory each of whom, after spending 12 months in the district, returns to the Central Laboratory for a period of 3 months. They thus have regular opportunities of 'refresher' courses and in partaking in more highly specialised work than can properly be performed in the districts.

It has not yet been possible to extend this measure but it is the intention as circumstances permit to provide similar facilities in each district hospital.

8. Effect has been given to the proposals for the re-grading of salaries recommended for laboratory assistants.

9. With the reorganisation of the Laboratory Service, the opportunity has been taken to accommodate in the Central Laboratory the Entomologist who, for many years, has been diverted from his proper duties and there is now that close co-operation between the various branches of medical research the lack of which has been evident in the past.

10. The report of the Senior Pathologist for 1947 is appended (Appendix I).

III.—Medical Services

HOSPITALS

11. In order to obtain more accurate statistical information regarding the incidence of disease as reflected by attendances at hospitals and dispensaries, a card index system has been instituted at Civil, Victoria and Mahebourg hospitals. It is the intention to extend this system to other institutions.

12. *Accommodation.*—Shortage of building material has delayed the programme designed to relieve the present congestion in hospitals but nevertheless some progress has been made.

At the Civil Hospital in Port Louis, two wards of 25 beds each are in course of construction and provision exists for the building of two more of similar capacity.

At the Mental Hospital, plans have been prepared for extension to relieve overcrowding and three new wards have been constructed. The remainder of the programme will be started shortly.

At Victoria Hospital, Candos, plans for the construction of an Orthopædic Department and a Rehabilitation Centre have been completed, and it is hoped that construction will begin in 1948.

The plans provide for the following—

Orthopædic Centre including an operating theatre

X—Ray Unit.

Orthopædic Wards.

Rehabilitation Centre.

The Rehabilitation Centre will represent the Colony's War Memorial and the funds, estimated at Rs. 385,000, will be provided by public subscription.

13. With a view to providing a more efficient hospital service in the northern districts of the island, it has been decided to build one general hospital of 250 beds to serve the needs of Pamplémousses, Rivière du Rempart and Flacq. This proposal is still in the planning stage but when it becomes an accomplished fact the present district hospitals will be available for other health purposes.

While the need for accommodation additional to that available at present has been recognised, one must continually bear in mind the fact that with improvement in social conditions generally, and with the control of malaria in particular, the demand for hospital accommodation will decrease and one must guard against the temptation to divert for hospital extension purposes credits from preventive measures the object of which is to reduce the demands on hospital accommodation.

14. *Equipment.*—The provision of new and the replacement of old equipment still proves difficult due to delays in supply particularly of linen and clothing. A departmental committee has been set up to make recommendations for the standardising of all hospital equipment and furnishings and another committee has revised the departmental pharmacopœa. The report of the former committee is expected at an early date.

A portable 'X' ray plant has been provided and is now in use, and a new 'X' ray plant for the Orthopædic Centre is on order from England.

15. *Personnel.*—The services of two ophthalmic surgeons on a part time basis are now available at Civil, Victoria and Moka hospitals. At the last named, the policy, discontinued, for a number of years, of obtaining the co-operation of private surgeons has been revived.

Nursing Staff.—Effect has been given to the proposals for the reclassification and regrading of the nursing posts in the hospitals. These are now classified as charge nurses, ward sisters, nurses and students; salaries have been regraded in accordance with the recommendations made in 1944, and several of the other recommendations made at that time have been implemented. Thus at Civil Hospital, it has

been found possible to reduce the working hours from ten or twelve hours a day on six days of the week to a total of 96 hours per fortnight. A similar scheme is being instituted at Victoria Hospital and, as sufficient trained staff becomes available, this will be extended to other hospitals.

The course of training for nurses has been increased from two to three years and a revised syllabus has been put into operation. It has not yet been possible to obtain the services of sister-tutors for the training schools although provision exists in the Estimates, and it is too much to expect a Matron of a large teaching hospital to combine with her substantive duties those of teaching although this is being done at present. It is therefore necessary to persevere in the endeavour to find candidates for these vacant posts.

Despite these advances no real solution to the problem of recruitment for the nursing profession can be found until nurses' homes have been established on the lines recommended. Free motor-transport is now provided to take nursing staff living at a distance to and from their homes, but for obvious reasons this does not solve the problem. The conversion of the building previously occupied by the Matron of Civil Hospital to a Nurses' rest-room with sleeping accommodation for night nurses during off-duty hours has proved that the fear expressed that nurses would refuse to live in hospital quarters is unfounded. While there is a reasonable prospect of building such a home at Victoria Hospital, there is little hope for Civil Hospital unless by renting or purchasing a building and none such is at present available.

Five women from Mauritius are at present, with the assistance of scholarships, training as nurses in English hospitals; two others are training there as physiotherapists and two as occupational therapists.

16. Hospital Statistics.—

	<i>In-Patients</i>	<i>Dispensaries</i>
Malaria	1,989	41,288
Diseases of teeth and gums	185	23,281
Injuries	3,001	9,934
Functional disorders of stomach	370	9,516
Cellulitis and abscess	2,010	9,447
Other skin diseases	784	7,948
Ankylostomiasis	483	7,580
Ascariasis	41	7,410
Scabies	209	6,759
Diarrhoea and Enteritis	534	6,051
Rheumatism	279	5,639
Diseases of the eye	632	4,681
Bronchitis	575	3,639
Anaemia	1,517	10,558
Asthma	259	2,797
Dysentery	542	2,681
Syphilis	305	1,314
Gonorrhœa	133	946
Tuberculosis	330	781
Schistosomiasis	70	361

17. *Radiology*.—Two dressers were detailed to undergo training as radiographers at Victoria Hospital and have made satisfactory progress.

Cases sent for X-ray examination by hospitals, Government Medical officers and general practitioners fall under two categories: those requiring plating (which is performed at Victoria Hospital) and comprise chiefly injuries and lesions of the skeletal tissues, and those requiring screening (performed at Moka hospital) which include diseases of the chest and of the upper alimentary tract, chiefly organic lesions of the stomach.

The number of cases examined at Victoria Hospital during the year was 2,146.

The number of cases screened at Moka hospital was: Chests: 960; alimentary tract: 593.

The figures for the two years immediately preceding were: for 1946: 1,209; for 1945: 645.

The record reached in 1947 is attributable to the activities of the new orthopædic centre and to the increased advantage taken by the profession generally of the facilities available.

Outpatients.—The treatments given were—

Irradiation with Infra Red	...	...	...	186
Ultra Violet	...	...	...	88
Interrupted faradic current	...	...	...	7
Surgical Diathermy	...	...	...	23

Radium Therapy.—67 cases of malignant disease were treated during the year of which 39 were inoperable carcinomas of the cervix uteri.

18. Orthopædics being a recent development of the colony's medical service, a brief account of the activities of that branch since its inception in 1946, as reported by the orthopædic surgeon, will be of interest.

The technical staff of this branch includes—

One orthopaedic surgeon
One orthopaedic sister
Two physiotherapists
One rehabilitation officer

A. TREATMENT OF ANTERIOR POLIOMYELITIS

1. *In-patients at Floreal Hospital*

In May 1946 there were 210 children in Floreal hospital, all victims of the epidemic of 1945. The majority were still bed-ridden, few had been fitted with calipers and none with spinal braces. By the end of 1947, 100 cases remained, of which about 50 were too severely paralysed to return to their homes and were therefore regarded as permanent in-patients. Except for a few recent admissions, all had been fitted with appliances. In the same period, 360 patients had been admitted to hospital and 420 discharged. (Not all of these were cases of poliomyelitis, and some had been admitted more than once).

In April 1947, an operating theatre was improvised in an empty ward. Here over 200 corrective and reconstructive operations had been performed by the end of 1947. Other empty wards have been adapted, one as a schoolroom, a second as an out-patient department and a third as a carpentry shop for older boys.

2. *Out-patients*

Several problems were presented by out-patients with poliomyelitis. All known cases had to be reviewed, lost cases traced, undeclared cases found and prejudice against treatment in hospital overcome. Nurses from Floreal Hospital, who have acted as district visitors since 1945, are responsible for tracing cases and preparing a scheme for follow-up clinics. Thanks to the unfailing help of Government medical officers, doctors of Sugar Estates and dispensers, it has been possible to hold these clinics at regular intervals. Prejudice has gradually been overcome as more and more children have been discharged from hospital improved by treatment.

There are now some 400 children in the island who have been treated and fitted with instruments. Each of these is seen regularly at least once a month by district visitors and by this means appliances are kept in good repair and parents are shown how they should be fitted.

Over one hundred cases of poliomyelitis of onset prior to 1945, some dating back to the last century, have been examined and at least half of these have been treated.

B.—TREATMENT OF OTHER ORTHOPAEDIC CONDITIONS

Orthopaedic out-patient clinics have been held weekly at Civil, Victoria and Floreal Hospitals since 1946. There has been a steady increase in the number of patients, and in the range of conditions seen.

(a) *Certain diseases deserve special note.*

Tuberculous disease of bone and joint. Sixty-five confirmed cases of tuberculous disease of bone and joint have been observed and more than half of these have been admitted to hospital. Contrary to expectation many of these have been allowed to remain in hospital for long periods, giving a reasonable chance of cure.

(b) *Congenital deformities.*

There appears to be a high incidence of congenital deformities in Mauritius. 240 such cases have been observed including 116 patients with congenital club foot. (190 feet affected).

(c) *Rheumatoid Arthritis and ankylosing spondylitis*

Forty seven cases of rheumatoid arthritis and ankylosing spondylitis have been recorded, some of these patients being completely crippled.

(d) *Amputees.*

Between forty and fifty amputees have passed through orthopaedic clinics. Some progress has been made in the fitting of appliances made overseas, and a few simple appliances have been made in the orthopaedic workshops at H.M. Prisons.

C. REHABILITATION

Despite lack of suitable accommodation and shortage of equipment, it has been possible to give out-patient treatment at Civil, Victoria and Floreal Hospitals. Daily treatment has been available at each hospital since October, 1946.

Attendances have increased steadily.

Dispensary Service

19. Apart from the outpatients' departments of the various hospitals, there are 39 dispensaries in the Colony situated as follows —

Port Louis District :

- | | |
|-----------------------|-----------------------|
| 1. Central Dispensary | 2. Eastern dispensary |
|-----------------------|-----------------------|

Pamplemousses District :

- | | |
|--------------------------------------|------------------|
| 1. Long Mountain Hospital Dispensary | 3. Pamplemousses |
| 2. Terre Rouge | 4. Bon Air |

Rivière du Rempart District :

- | | |
|------------------------------------|----------------|
| 1. Poudre d'or Hospital Dispensary | 3. Grand Gaube |
| 2. Grand Bay | 4. Le Ravin |

Flacq District :

- | | |
|------------------------------|---------------------|
| 1. Flacq hospital Dispensary | 5. Rivière Sèche |
| 2. Medine (Camp de Masque) | 6. Trou d'eau douce |
| 3. Brisée Verdière | 7. Sébastopol |
| 4. Saint Julien | |

Moka District :

- | | |
|---------------|-----------------------|
| 1. Pailles | 3. Quartier Militaire |
| 2. St. Pierre | |

Grand Port District :

- | | |
|----------------------------------|-------------------|
| 1. Mahebourg Hospital Dispensary | 4. L'Escalier |
| 2. Rose Belle | 5. Old Grand Port |
| 3. Plaine Magnien | 6. St. Hubert |

Savanne District :

- | | |
|---------------------------------|-------------------|
| 1. Souillac Hospital Dispensary | 3. Chemin Grenier |
| 2. Rivière des Anguilles | 4. Baie du Cap |

Black River District :

- | | |
|-------------------|----------------|
| 1. Petite Rivière | 4. Black River |
| 2. Bambous | 5. Tamaraïn |
| 3. Case Noyale | |

Plaines Wilhems District :

- | | |
|---------------------------------|--------------|
| 1. Victoria Hospital Dispensary | 3. Vacoas |
| 2. Curepipe Road | 4. Rose Hill |

The number of attendances at dispensaries (stationary and mobile) and outpatient departments of hospitals was: Male, 154,764; Female, 145,394.

20. To provide further facilities for persons residing in districts remote from existing centres, a mobile dispensary service has been introduced. The unit consists of a motor lorry, the body of which is fitted out as a dispensary with lateral folding attachments to serve as waiting and consulting rooms. The staff includes a private practitioner engaged on a part time basis and a dresser. Two such units have begun work and pay weekly visits to L'Aventure, Quatre Sœurs, L'Eroignard, Quatre Cocos (Flacq), Creve Cœur, D'Epinay, Congomah (Pamplemousses) Grand Bois, La Flora (Savanne), Anse Jonchée, Grand Sable (Grand Port) Mare Tabac, Cluny, Nouvelle France, Pont Colville.

These mobile dispensaries are proving to be a popular innovation and are well attended.

IV, Health Services

VITAL STATISTICS

21. From the point of view of public health 1947 was a particularly good year. There were no major epidemics and the death rate for the colony (20.1) was the lowest on record since 1870, when it was 22.6 per thousand. The average for the decennial period 1938-1947 was 27.7.

BIRTHS

22. The population of Mauritius, the area of which is 720 square miles, was at 30th June, 1947 estimated to be 432,422 and the density of population 600.58 per square mile. There were 18,926 births, males 9,589 and females 9,337 of which 5,829 occurred in the general and 13,097 in the Indian population giving a total birth rate of 43.8 as compared with 38.7 per thousand in 1946.

Still births, which are not included either as births or as deaths numbered 1,277, the percentage of still births to live births being 6.7 as compared with 8.4 in 1946. The mean percentage for the five years 1943-1947 was 7.7, that of the general population being 5.2 and of the Indian population 8.8%.

DEATHS

23. 8,680 deaths were registered in 1947 (males 4,449 and females 4,231); the death rate as stated was 20.1 per 1,000, that of the general population being 17.5 and of the Indian 21.6, as compared with 29.5 for the colony in 1946.

24. The following table gives a comparison of the causes of death for the past three years with the rates per 1,000 of population:

Group	No of deaths 1947	Rate per 1,000		
		1947	1946	1945
1. Infective and parasitic diseases	2,366	5.47	9.1	11.6
2. Cancer and other tumours	76	0.17	0.1	0.1
3. Rheumatism, diseases of nutrition	111	0.26	0.3	0.4
4. Diseases of the blood and bloodforming organs	577	1.33	2.0	2.1
5. Chronic poisoning and intoxication	4	0.01	0.0	0.0
6. Diseases of the nervous system and sense organs	339	0.78	1.0	0.9
7. Diseases of the circulatory system	206	0.48	0.6	0.6
8. Diseases of the respiratory system	893	2.06	2.7	3.6
9. Disease of the digestive system... ..	1,026	2.37	4.6	5.4
10. Diseases of the urinary and genital system (not venereal or connected with pregnancy or the puerperium)	300	0.69	1.2	1.3
11. Diseases of pregnancy and child birth and the puerperal state	106	0.24	0.4	0.6
12. Diseases of the skin and cellular tissue ...	47	0.11	0.2	0.2
13. Diseases of bones and organs of movement ...	3	0.00	0.0	0.0
14. Congenital malformations	6	0.01	0.0	0.0
15. Diseases peculiar to the first year of life ...	1,129	2.61	2.8	3.4
16. Senility—old age	381	0.88	1.2	1.4
17. Death from violence	172	0.40	0.4	0.6
18. Ill-defined causes of death	938	2.17	3.0	3.8

25. Group I continues to be the greatest cause of mortality and the following table gives the percentage of deaths and the rate per 1,000 of the population during the five year period 1943-47.

	1943	1944	1945	1946	1947
Percentage of total deaths due to Infective and Parasitic diseases... ..	31.3	28.5	32.0	30.8	27.2
Rate per 1,000 of the population	8.1	9.1	11.6	9.1	5.5

The infantile mortality rate was 113.9 as compared with 145.2 in 1946 and the maternal mortality rate (number of deaths per 1,000 births) was 5.25 as compared with 10.39 in the previous year.

It must be recollected that there has been in Mauritius no provision for compulsory medical certification of the cause of death, and consequently statistical figures must be treated with reserve. This measure however will become operative in 1948 in the areas of the Municipality of Port Louis and of the Township Boards and will be extended to other districts as soon as circumstances permit.

MALARIA AND ANTI-MALARIAL MEASURES

26.—(i) Following upon the recommendations made in 1944, a Malaria Advisory Board was set up in 1946. The terms of reference of the Board which is representative of all sections of the community are as follows—

“For the purpose of research into and investigation of all problems and matters relating to the incidence of malaria and other mosquito-borne diseases in the Colony as well as for the purpose of advising Government generally on the measures to be taken for the control of such diseases and any matter incidental to or connected with such control.”

In 1946 two Ordinances were passed by Council of Government: The Prevention of Malaria Ordinance and the River Reserves (Control of Vegetation) Ordinance. The former gives wide powers for the control of malaria while the latter provides for the control and maintenance of vegetation along river reserves. An organisation on the lines recommended by the Malaria Control Committee but with certain modifications has been constituted and operates in the districts of Plaines Wilhems, Moka, Port Louis and Pamplemousses. Funds are provided from Colonial Welfare and Development Grant. In the other districts, the system of control by ‘Cantonniers’ (part-time job contractors) has been abolished and the savings thus secured are used for payment of regular labourers working under regular supervision. Where adequate control of this labour has been possible, the improvement has been marked as may be exemplified in the area of Mahebourg. Here, works carried out in 1942-43 by the Admiralty have been maintained and it has been possible to expand considerably the controlled area. The results have been most encouraging. Within the controlled area, the spleen rate of school children which in 1942 was from 30 to 55 per cent. had fallen in December 1946 to between 3.5 and 5.4 per cent. while outwith the controlled area, there was little change.

As works are completed they are handed over to the maintenance branch and become a charge on general revenue.

The following summary of work done has been prepared by the Officer in Charge—

“The anti-malarial works which started on an experimental scale 1944 have successfully withstood cyclones and floods. In spite of the flood waters which every year overflow river banks and marshes, the pioneer stone walling done in 1944 at Ruisseau Citron, Pamplermousses, still holds good, and the earth drains cut in Engrais Cathan now drain cultivated land which four years ago was but a foul swamp and a prolific breeding place.

The improvement in the quality of work of canalisation will not be discussed here, but the following is a recapitulation of what has been and is being done :

PAMPLEMOUSSES

POWDER MILLS

- | | |
|--------------------------------|--|
| 1. River Citron | Canalisation in progress |
| 2. Beau Plan Canal | Lower part canalised. |
| 3. English Canal | Completely canalised. |
| 4. Observatory drain | Canalisation completed to Powder Mills Road |
| 5. Powder Mills drain | Completely canalised |
| 6. Side drains to above | Completely canalised thus draining about ten acres of marshy ground which have since been put under cultivation. |

PLAINES WILHEMS

- | | |
|--------------------------------------|---|
| 1. Eau Coulée | Engrais Cathan Marsh, about 50 acres in extent, drained completely in 1944 (since 25 acres put under cultivation) |
| 2. Grand Malabar | La Chaumière marshes completely drained in 1944 |
| 3. Ligne Berthaud, Vacoas | Jamalac marshes (2 acres) drained completely in 1945, now planted in foodstuffs |
| 4. Clairfond Marsh | Drains completely rebuilt and improved after 40 years ; the major works having been originally carried out in 1907 after Sir Ronald Ross' visit to the Colony |
| 5. Quatre Bornes | Ramgoolam drain, canalised completely thus draining the place called “Mare la Colle” which was the place where mosquitoes coming from “Bassin” put up before reaching “La Louise” |
| 6. Candos Hill | All the drains completely canalised |
| 7. Rose Hill | Plaines Wilhems River canalised from Trianon to Rose Hill |
| 8. Curepipe, River Eau bleue | Canalisation in progress |
| Antelme, Guimbeau and Boullé marshes | Completely drained. |
| Curepipe barracks | Drains reopened and marshes drained by newly-cut canals |

PORT LOUIS

- | | |
|------------------------------|---|
| 1. Signal Mountain | Regrading and canalising the Circular drain at the foot, which now collects all the waters originally flooding Pouce Valley drain below. This has brought about a decrease in the volume of flood waters in Ruisseau du Pouce during the rainy season |
| 2. River Terre Rouge | Canalised from Bathurst Canal to the sea |
| 3. River Lataniers | Effectuated repairs to masonry parts |
| 4. Vallée des Pretres | Canalisation of small drains |
| 5. River St. Louis | Canalisation in progress |

MOKA

1. Mountain Ory drain	...	...	Drain completely canalised
2. Ebene Drain ...	...	...	do do
3. Ebene Marsh	...	...	Completely drained thus converting about 2 acres of swamp into dry land fit for cultivation
4. Feeder Bonham	...	...	Canalisation in progress
5. Bon Air Canal	...	...	do do
6. Reduit Canal ...	...	...	do do
7. Irrigation canals of Le Reduit Government House			Completely repaired
8. Rivulet Agrément	...	...	Canalisation in progress
9. River Baptiste	...	...	do do
10. Rivulet Chaillet	...	...	do do
11. River Cascade	...	...	Put under control from Cote d'Or to Verdun
12. Rivulet Canet	...	...	Canalised from Mon Désert Dyke to Valetta Road
13. Upstream of Valetta Road	...	...	Canalisation in progress.

13. Jauffrey drain—canalised through village.

14. Sans Souci—canalisation in progress.

It is encouraging to know that following up on these works are the maintenance gangs who keep all new works in a state of repair and under control, thus preventing breeding places recurring in these areas."

Experiments in the control of malaria were continued in Black River District with notable results. A summary of this work is appended (Appendix II).

In the South of the Island, systematic spraying of the interior of houses and cattle sheds was begun. The area around the districts of Grand Port and Savane amounts to about 21 square miles and the number of buildings treated was 16,578 with a superficial surface of 14,495,000 sq. feet. In Black River some 16 square miles were dealt with including 2,960 houses and 2,603,000 sq. feet of surface.

It is too early to make any definite pronouncement on results of malaria control during the past few years, nevertheless it will be of interest to compare the position during the five years 1943-47 as evidenced by the mortality rate ascribed to malaria and malarial cachexia during that period.

Year	Deaths ascribed to malaria and malarial cachexia	Rate per 1,000 living
1943 ...	2,407	5.87
1944 ...	2,917	6.95
1945 ...	3,534	8.34
1946 ...	2,918	6.88
1947 ...	1,782	4.12

As already stated these figures must be treated with reserve and, indeed, the figure for 1945 appears unduly high in light of hospital admissions in the same year. The numbers admitted to hospitals for the same period were as follows—

Year	Hospital Admissions
1943 ...	3,215
1944 ...	3,512
1945 ...	3,244
1946 ...	2,522
1947 ...	1,989

(ii) *Filariasis*.—62 cases of filariasis were treated in hospitals and 136 in dispensaries during 1947.

(iii) *Plague*.—No case occurred.

(iv) *Small Pox*.—There were no cases of small pox. 11,199 children were vaccinated by public vaccinators during the year.

Successful vaccinations on first attendance	...	8,262	
Successful vaccinations on second and subsequent attendances	...	1,942	
			10,204
Unsuccessful vaccinations	...	...	882
Results not ascertained	...	...	113
TOTAL	...		11,199

59·17 per cent. of children born were vaccinated by public vaccinators. Infants vaccinated by private medical practitioners are not included in this figure.

(v) *Enteric Fever*.—405 cases with 87 deaths were notified as compared with 627 and 112 deaths in 1946. The notification of this disease represents an incidence of 0·93 per 1,000 of the estimated mid year population. The incidence was highest in Rivière du Rempart (1·88 per 1,000) and lowest in Black River (0·41) and Plaines Wilhems (0·63 per 1,000).

16,545 persons were inoculated against typhoid fever.

(vi) *Diphtheria*.—85 cases were notified as compared with 56 in 1946. The disease occurs sporadically and is generally mild in character.

(vii) *Diseases and accidents associated with the puerperal state*. Though various non-communicable conditions are included in these statistics, it is convenient to group them under one head since their significance lies in revealing certain causes of maternal and infantile mortality.

106 deaths were registered as being due to the puerperal state.

6 cases of puerperal septicæmia, of which 2 proved fatal, were treated in hospital, a case mortality of 33·3 per cent.

The maternal mortality rate (the ratio of the number of deaths ascribed to the puerperal state to the total number of births including still-births) was 5·25 per 1,000 in 1947 as compared with a rate of 10·39 per 1,000 for the previous year.

(viii) *Erysipelas*.—22 cases were notified, compared with 38 in 1946, 1 death was registered.

(ix) *Tuberculosis*.—Of the 8,680 deaths of 1947, 171 were ascribed to tuberculosis.

(x) *Leprosy*.—The disease is well under control and appears to be in regression.

Six patients, 3 male and 3 female, were admitted to the Leper Hospital, two of which were re-admissions, one male and one female.

One male patient was discharged moribund and subsequently died. One male patient died of chronic bronchitis during the year.

(xi) *Venereal Diseases*.—295 cases of admissions for syphilis and 5 deaths from this disease were recorded from the hospitals during the year. 133 cases of gonorrhœa were treated, and 43 cases of soft chancre.

(xii) *Ankylostomiâsis*.—483 cases were treated in hospitals and 7,732 in the dispensaries, and the number of deaths in hospitals ascribed to that disease was 8.

Work by the Hookworm Unit was confined to weekly treatments at Curepipe. 11,135 treatments were given during the year.

(xiii) *Schistosomiasis*.—70 cases were treated in the hospitals during the year and 455 at the dispensaries.

NUTRITION AND NUTRITIONAL DISEASE

27. The report for 1947 of the Nutrition Officer is appended. (Appendix III).

The following is a summary of the work done.

(i) *Training Course*.—A course in Nutrition at the Training College, started in November 1946, was continued until August 1947. This course was given to six domestic science teachers of the college. They were all given a fairly detailed theoretical training, and five of them did practical work in hospitals, infirmaries, schools and welfare centres.

(ii) *Supplies*.—A report on the present supply position was submitted early in the year. This was considered by the Departments concerned, and the chief result was an increase in the importation of salt fish and an attempt to increase the consumption of yeast by the general population.

(iii) *Feeding in Poor Law Institutions*.—During July and August detailed surveys were carried out in four typical institutions.

The result of these investigations showed the feeding to be of a very low standard, particularly in the case of children. A report was submitted and the grant for food was increased by 20% in the case of children.

(iv) *School-Meals*.—The feeding of 1,600 children in the Grand Port area with a hot mid-day meal was continued. A snack meal consisting of a milk drink, biscuits and yeast tablets was started in December and given to 1,000 additional children. These children, and about 1,000 more, have been weighed and measured and medically examined by the Health Officer of the Education Department. The examination is to be repeated in about 4 months in order to gain evidence of the value of this snack meal.

(v) *Mental Hospital*.—As a result of the high incidence of pellagra in the hospital, a detailed investigation into the feeding was carried out over a period of a fortnight. The results are not so far clear, as they seem to indicate that the diet, while capable of improvement, is not sufficiently inadequate to account for the outbreak of pellagra on the grounds of straightforward food deficiency alone and it appears that there may be some other factor involved.

(vi) *Lecture Courses*.—A course of lectures was given to Social Welfare Workers, and the students were examined at the end of the course. Another course of 6 lectures including practical cookery demonstrations has been given to those in charge of Infirmaries and Orphanages. The domestic science teachers have given a series of simple lectures and demonstrations (in Creole) in five child welfare centres.

28. The following deficiency diseases were recorded during the year—

Total cases of Deficiency Disease treated in hospital :

Beri-beri	...	...	3	Avitamisosis " B "	...	16
Rickets	...	...	5	Avitaminosis undetermined	...	383
Avitaminosis " A "	...	...	9	Pellagra	...	47
				Scurvy	...	1

In addition to the above, 165 patients were treated in hospital for malnutrition.

Total number of cases at Dispensaries for Deficiency Diseases—

Rickets	...	...	28	Pellagra	...	191
Beri-beri	...	...	17	Avitaminosis undetermined	...	585
Scurvy	...	...	25			

FOOD AND DRUGS IN RELATION TO HEALTH AND DISEASE

There are six public and four private abattoirs in the Colony. The public abattoirs administered by the Municipality of Port Louis, the Board of Beau Bassin—Rose Hill, and Curepipe, are each controlled by a veterinary officer. The other abattoirs are conducted under the supervision of a sanitary staff. A new abattoir has been constructed in Flacq district and will be opened when the equipment arrives from the United Kingdom. It may be said that on the whole the foodstuffs marketed are wholesome and of good quality. The only condition found with any frequency in the meat trade is tuberculosis. Cestode infection is uncommon among cattle, and it is very rarer in human beings.

Adulteration of milk is a very common offence in spite of sanctions, fines and even imprisonment. In 1947 there were 316 successful prosecutions. Fines imposed amounted to Rs. 13,554 and terms of imprisonment reached the total of 39½ months, 30 weeks and 135 days with and without hard labour.

Draft legislation has been prepared to permit of a proper control of the manufacture, storage and sale of articles of food and drink intended for human consumption.

MATERNITY AND CHILD WELFARE

29. This service is carried out mainly by the Maternity and Child Welfare Society and, in Port Louis by *La Société Pasteur de la Goutte de Lait*. The latter was taken over by the Municipality at the end of 1947. The former has 10 centres situated at Curepipe, Rose Hill, Beau Bassin, Vacoas, Henrietta, Quatre Bornes, Centre de Flacq, Rose Belle, Rivière des Anguilles and Mahebourg. The Government grant in 1947 was

Rs. 41,000 and Government provides the part-time services of a Superintendent of Midwives and for the training of midwives for the Society. A new centre, constructed by the Public Works Department was opened in Quatre Bornes in the course of the year. The Society employs 28 midwives. The following is a brief summary of the work done—

Confinements	2,028
Total attendances at Ante and Post natal clinics	1,356
Total attendances of infants for weighing and supervision... .	18,766
Visits to infants	3,452
Average number of infants receiving milk daily	759

30. Three qualified midwives are employed by Government. They made 2,566 visits and attended 570 confinements.

Three midwives are under training at Government centres.

An ante-natal clinic has been established at the Civil Hospital, Port Louis. It started on the 20th May, 1947 with six cases, and by the end of the year under review, 397 cases had been attended to. The week-average attendance at the clinic was 59.

SCHOOL MEDICAL SERVICE

31. Owing to lack of personnel it has not yet been possible to institute a School Medical Service but opportunity was taken by the Medical Officer of the Teachers' Training College to investigate conditions of school children in those schools where school meals have been instituted. Details of the latter will be found in para. 4 of the Nutrition Officer's Report for 1947.

32. Following upon the dental survey of school children carried out in 1946 a clinic has been established in Port Louis.

The Port Louis Dental Clinic, situated in the grounds of the Civil Hospital was completed in November 1947 when the equipment was transferred there from the temporary quarters in which the clinic had hitherto been accommodated.

During the year under review, dental treatment was given to school children (mostly of the school leaving age), casuals, police force and military personnel. Treatment was confined to extractions, conservative work and oral surgery. Morning and afternoon sessions were held and in the course of 471 sessions, dental treatment was given to 7,031 patients as follows :

School children	4,651
Casuals	1,044
Police Force	405
Military Personnel	931

The nature of dental treatment was :

Filling inserted in permanent teeth	4,015
Permanent teeth extracted (mostly amongst casuals)	1,062
Temporary fillings	393
Temporary teeth extracted	920
Gum treatment	1,117
Fractures	10

During the school holidays, appointments were given to school children individually, not only with the idea of following up treatment but also to ascertain how keen they were with regard to their dental health. The response was excellent as only 5 per cent. did not attend for treatment. So far, orthodontic treatment has been carried out by extractions only but it is hoped to be able to correct gross malformations by orthodontic appliances soon.

The active co-operation of the Director of Education in purchasing tooth brushes to be sold in schools is appreciated.

Port Health Work and Administration

33. The following table summarises the work done by the Port Sanitary Authority:

Vessels arriving	...	...	...	...	...	196
Crews examined	...	...	...	...	...	10,168
Passengers examined	...	...	...	...	...	3,194
" plus troops	...	...	...	...	...	1,061
Vessels given pratique on arrival	...	...	...	...	...	143
Vessels given pratique after disinfection of the linen and effects of the passengers, crew, fumigation and disinfection of the fore-castle	...	...	...	...	...	43
Vessels given pratique after disinfection of linen, etc., and claytonisation of cargo	...	...	...	...	...	10
Vessels arriving from infected ports	...	...	...	...	...	106
Vessels detained for purposes of disinfection and fumigation on account of plague, cholera or small-pox	...	...	...	...	...	—

1,302 passengers, coming by surface route from infected areas, were put under surveillance.

58 civil aircraft arrived in the Colony, with 1,426 passengers, 455 of these passengers, coming from infected areas, were put under surveillance.

34. *Statements showing the number of rodents caught and found dead in Port Louis during the year 1947—*

Rats	...	...	13,708
Mice	...	...	2,037
			—
TOTAL	...	...	15,745
			—

Number of rodents microscopically examined—

Rats	...	...	13,507
Mice	...	...	2,016
			—
TOTAL	...	...	15,523
			—

SPECIES OF RATS

<i>Rattus Rattus</i> <i>Rattus</i>	<i>Rattus Rattus</i> <i>Alexandrinus</i>	<i>Rattus Rattus</i> <i>Frugivorus</i>	<i>Rattus Rattus</i> <i>Norvegicus</i>	Total
54	10,829	65	2,760	13,708
Number of rodents found plague infected				...
Number of Gravid females				...
Number of young ones				...
Number of rats found dead				...

GENERAL MEASURES OF SANITATION

35. There has been in the district of Plaines Wilhems (the only one in which it has been possible to introduce the essentials of a district health service) considerable advance in sanitation and this has been followed as a natural corollary by improvement in the general health of the district, an improvement which is reflected in the vital statistics.

While deficiencies in technical staff have operated against any marked advance in the sanitary condition of the Colony generally, progress has been made in various directions, and, in particular, in establishing a competent and reliable sanitary inspectorate without which no health service can function.

The educational standard required of recruits for this division is that of the School Certificate, and, despite misgivings which were expressed that this standard was too high, there has been since it was imposed no scarcity of candidates. The course of training includes a syllabus of lectures and demonstrations on the lines of the curriculum of the course for the Certificate of the Royal Sanitary Institute and in addition six months of practical field work under supervision. Courses of lectures in various subjects are given by the Medical Officer of Health Plaines Wilhems, the Senior Pathologist, Veterinary Surgeon and by the Chief Health Officer of Curepipe. During the past three years 18 cadets having passed the examination have been appointed Sanitary Inspectors. At present 15 are under training. Two Sanitary Inspectors underwent an advanced course of training in East Africa during 1947 and it is proposed to send another to England in 1948.

36. The Municipality of Port Louis and the Townships of Curepipe, Quatre Bornes, Rose Hill and Beau Bassin are responsible for the scavenging of their respective areas and for control of abattoirs and markets, other sanitary services being the responsibility of the Government department. Such division of responsibility inevitably results in inefficient service and until one or other authority assumes responsibility for the whole service of an area, full satisfaction cannot be achieved. The principal obstacles to abolishing this dual control are the absence from the staff of the local authorities of a qualified executive officer to co-ordinate the various services, that is of a medical officer of health, and the lack of municipal personnel with an adequate training in sanitation. It has been the policy of the department to devise means to remove these obstacles and to endeavour to secure the co-operation of the local authorities to this end.

The policy, briefly stated, is as follows—

Local authorities should be responsible for all matters pertaining to sanitation in their areas with the exception of measures for the control of malaria. Each local authority should employ a senior health inspector, and the requisite number of sanitary inspectors who should be required to possess the Sanitary Inspector's certificate awarded by the Government Department. The senior health inspector, working under the guidance of the medical officer of health of the district, should be responsible to the Local Authority for all sanitary services. It should be the aim of the Local Authorities to appoint medical officers of health when circumstances permit.

37. In the Municipal area of Port Louis progress is slow and it may not be out of place to quote a statement made in 1944 which reads as follows—

“The salient features of the present sanitary services of the Municipality are :

- (a) inefficient street scavenging due in large measure to lack of water for street cleansing ;
- (b) lack of cleaning and maintenance of storm water drains ;
- (c) mosquito breeding in water containers in back yards and other private premises and in garden ponds which are maintained owing to lack of a constant water supply ;
- (d) sewers so charged that they cannot take all waste water from industrial premises, the fulness of the sewers being due in no small degree to the quantity of waste water entering them from leaking taps, broken pipes and faulty fittings ;
- (e) mosquito breeding in pools caused by leaking taps and pipes and “ regards ” ;
- (f) failure to enforce sanitary by-laws, due in part to lack of supervision by the Municipality and to the division of responsibility between the Municipality and the Government department. ”

“Reflection will show that the cause of (a), (b) and (c) is water shortage, while the conditions described in (d) and (e) are due largely to water wastage. ”

38. In Curepipe the Board of Commissioners has appointed a Senior Health Inspector responsible for all sanitary services in the area of the Township, the emoluments of the post being provided in equal parts by Government and the Board. The services of this officer, who has a wide experience as a Sanitary Inspector in England and in India, should result in modernising the services of which he is in charge and in instructing the junior personnel in modern methods. The Senior Health Inspector works in close co-operation with the Medical Officer of Health of the district, who, as part of his many duties, acts as adviser on health matters to the Townships in Plaines Wilhems.

Remarkable progress has been made in the townships of Quatre Bornes and Beau Bassin-Rose Hill. In both of these, scavenging by contract has been replaced by direct services. In the case of the former the old hand carts have been replaced by modern freighters and the refuse is composted on a neighbouring estate, while the latter township will follow suit in 1948. So far as scavenging is concerned these townships now serve as a model of street cleansing.

39. In rural areas the collection and disposal of refuse which is performed by contract leaves much to be desired. The appointment of Civil Commissioners and the development of Village Councils should help to develop in rural communities a sense of civic responsibility without which efforts to raise the standard of cleanliness are a thankless task. It is the intention in the coming year to abolish the contract

system in certain villages with progressive councils, and to carry out the scavenging service by direct labour employed under the supervision of the councils.

40. Port Louis continues to be the only town which has a sewerage system and a part of it still remains to be included in the scheme. The townships of Curepipe, Quatre Bornes and Rose Hill-Beau Bassin, with a combined population of some 65,000 still depend on privy pits and bucket systems although a number of premises have septic tanks. Curepipe, with a population of some 27,400 is largely served by a system of buckets with removal of night soil to a disposal plant in Phoenix. The only alternative to this system, which is an offence in every sense of the term, is its replacement by a sewerage system which should include the other townships. The advice of a consulting engineer has been obtained and it is a matter of first importance that effect should be given to the recommendations made by him. The estimated cost is Rs. 16,271,000.

41. *Water Supplies.*—The Development and Welfare Scheme has been planned to supply the whole of the Island with filtered and chlorinated water.

There will be two main reservoirs—

- (a) The Mare aux Vacoas Existing Reservoir of 597 M.C.F. will supply the whole of Plaines Wilhems, part of Port Louis, Moka, Montagne Longue and Vallée des Prêtres, upper Grand Port, Savane, and Black River with water filtered at La Marie Works.
- (b) Piton du Milieu Reservoir will supply the lower part of Grand Port and Savane Districts, Flacq and will supplement the existing supplies in Pamplemousses and Rivière du Rempart districts.

The quantity aimed at is 30–35 gallons per head of population in the towns and 27 gallons per head in the districts.

In 1947 a start was made with a Service Reservoir in the North to supply Goodlands area.

In Flacq district the mains have been replaced by new and larger ones planned in the Development and Welfare Scheme. This has improved the situation slightly pending the completion of the scheme.

Construction of Piton du Milieu Reservoir is due to start in 1949.

Various small improvements were carried out in the Mare aux Vacoas System. A concrete conduit to La Marie improved the amount pumped to Curepipe. And a 21" to 12" main from La Marie to Moka is on order.

42. *Dependency of Rodrigues.*—An excerpt from the Report of the Government Medical Officer, Rodrigues, is appended. (Appendix IV)

CONCLUSION

My thanks are due to individual officers of the department for their kind and active co-operation and assistance throughout the year.

18th October, 1948.

A. RANKINE,
Director,
Medical and Health Department.

APPENDIX I

Annual Report of the Bacteriological Laboratory for the year 1947

STAFF

Senior Pathologist	:	H.D. Tonking M.R.C.S. (England) L.R.C.P. (London)
Pathologist	:	A. Ng Chhung Hin MB., B.Ch., B.A.O (NUI). D.C.P. (London), D.T.M. & H. (England).
Government Chemist	:	E. Collins, M.A. (Cantab) F.R.I.C.
Medical Entomologist	:	S. Gébert
Assistant Government Chemist	:	R. Avice du Buisson, R.A.C. (Mauritius)
Senior Laboratory Assistant (Pathology)	:	L. Webb
Junior Laboratory Assistant (Pathology)	:	J. E. Herval
"	:	K. Topsy
"	:	Mrs. R. Giraud
"	:	Miss A. de Gersiny
"	:	Miss L. Webb
Laboratory Assistant	:	L. Arouff
"	:	Miss M. d'Agnel
"	:	Miss M. Fleuriot
Clerk	:	L. F. Legrigore.

On 10th, February Dr. A. Ng Chhung Hin was appointed to the post of Pathologist but seconded for duty as Resident Medical Officer at the Civil Hospital until 1st July when he assumed duty at the Central Laboratory.

Dr. H. D. Tonking left the Colony on overseas leave in August and his duties were taken over by the Pathologist, Dr. A. Ng Chhung Hin.

In September Mr. E. Collins, the Government Chemist, left the Colony on transfer to Hong Kong, the post of Government Chemist has since, been vacant.

Mr. R. Avice du Buisson was appointed to act as Government Chemist and Mr. J. Herval to perform the duties of acting Government Chemist.

Miss L. Webb was appointed Junior Laboratory Assistant since 1st. July

The work of the laboratory is still increasing. During the year we dealt with 24,848 specimens at the Central Laboratory including examinations made in connection with D.D.T. and Paludrine experiments. The two branches at Civil and Victoria Hospital together dealt with 13,460 specimens, making a grand total of 38,308 examinations.

The Central Laboratory is at present situated in an out of the way place where transport facilities are scarce causing considerable inconvenience to the general public. There is now a hope that we may move it to a more central situation where it will be more accessible to the general public and medical practitioners.

We hope that in the near future we will be able to open a new branch laboratory at Mahebourg.

Typhoid Fever.—The mass inoculation with T.A.B. vaccine instituted in 1946 has been of great benefit to the general public. The number of specimens examined for this disease this year has decreased, so is the percentage of positive cases. This policy is still being continued.

Malaria.—During the year 5,455 thick smears were examined in connection with D.D.T. campaign, Paludrine and S.N. 7,618 experiments.

90 mosquitoes were dissected in the laboratory of these 15 contained malarial parasites.

S.N. 7,618 and Paludrine.—A small quantity of the American product S.N. 7,618 or chloroquine was received and this was tried out at the Mental Hospital, Beau Bassin, in conjunction with Paludrine under the supervision of the Superintendent of the said hospital. Though the results obtained proved both to be excellent anti-malarial drugs, the former proved to be superior, as not one smear from those patients taking S.N. 7,618 contained the parasite. When supply becomes available, a larger scale experiment need be carried out to prove its real efficacy.

Experiments were also carried out with Dr. Goupille at Beau Plan and Solitude Sugar Estates to ascertain the efficacy of Paludrine. The experiments were first carried out by spraying buildings with D.D.T. alone and thick smears taken. Later the same buildings were again sprayed with D.D.T., in addition the inhabitants were given paludrine. The results showed that with paludrinisation, both parasite and carrier rate showed a marked drop.

Medical Entomology.—This report includes, for the first time, the annual report of the Medical Entomologist, who moved to the Central Laboratory in 1946. It is of course obvious that as Medical Entomology and Medical Research are so closely dovetailed, the natural headquarters of the Entomologist should be at the Central Laboratory. How fruitful this symbiosis has been is shown by the list of publications which include the discovery of two new species and the report of the presence of *A. melas* in salt water pools at the coast. (App. D to this Report).

LABORATORY RECEIPTS IN THE FORM OF FEES

The total earnings for the year amounted to Rs. 15,893.87

ROUTINE EXAMINATIONS

A total of 5,368 examinations exclusive of those made in connection with D.D.T. and Paludrine experiments (5,545) and of the Chemical Division which carried out 3,935 examinations (Appendix A.) and of the Branch Laboratories (Appendix B and C).

The work of the Laboratory is divided up into the following sections—

- I. Medical Biological.
- II. Pathology.
- III. Bacteriological.
- IV. Haematology.
- V. Serology.
- VI. Laboratory Products.

I. MEDICAL BIOLOGICAL

A. 4,263 SIMPLE ROUTINE EXAMINATIONS WERE MADE

(a) *Blood (Microscopical)*

Films for malaria :

<i>Plasmodium malariae</i> ...	...	...	...	5
<i>Plasmodium vivax</i> ...	...	...	...	79
<i>Plasmodium falciparum</i> ...	...	...	...	99
Undetermined rings ...	...	...	...	60
No parasites found ...	...	...	...	651

Films for microfilariae :

<i>Wuchereria bancrofti</i> ...	...	...	...	38
No microfilariae ...	...	...	...	96

TOTAL ... 1,028

(b) *Faeces. (Microscopical)*

Total number examined ... 2,069

Helminths :

<i>Bertiella studeri</i> ...	...	...	...	1
<i>Taenia saginata</i> ...	...	...	...	1
<i>Ascaris Lumbricoides</i> ...	...	...	...	1
<i>Oxyuris vermicularis</i> ...	...	...	...	1
<i>Trichuris ova</i> ...	...	...	...	718
<i>Ascaris ova</i> ...	...	...	...	149
"Hookworm" ova ...	...	...	...	731
<i>Strongyloides larvae</i> ...	...	...	...	95
<i>Trichostrongyle ova</i> ...	...	...	...	2
<i>Enterobius vermicularis ova</i> ...	...	...	...	7
<i>Isopora hominis ova</i> ...	...	...	...	1
<i>Clonorchis sinensis ova</i> ...	...	...	...	1
<i>Ternidens deminutus ova</i> ...	...	...	...	1

Protozoa :

<i>Entamoeba histolytica</i> ...	...	...	...	109
<i>Entamoeba coli</i> ...	...	...	...	82
Vegetative and precystic entamoebae ...	...	...	...	98
<i>Iodamoeba butschlii</i> ...	...	...	...	1
<i>Endolimax nana</i> ...	...	...	...	64
<i>Giardia intestinalis</i> ...	...	...	...	90
<i>Chilomastix mesnili</i> ...	...	...	...	36
<i>Trichomonas intestinalis</i> ...	...	...	...	87
<i>Blastocystis hominis</i> ...	...	...	...	272
No helminths or protozoa ...	...	...	...	573

(c) *Urine. (Microscopical)*

Total number examined ...	...	...	...	...	1,099
Hyaline casts ...	...	...	...	...	113
Granular casts ...	...	...	...	...	168
Waxy casts ...	...	...	...	...	16
Leucocytic casts ...	...	...	...	...	18
Cellular casts ...	...	...	...	...	11
<i>Schistosoma haematobium</i> ...	...	...	...	...	82
<i>Trichomonas vaginalis</i> ...	...	...	...	...	13
<i>Microfilaria</i> ...	...	...	...	...	1

(d) *Cerebro-spinal Fluid*

Total number examined ...	...	...	...	...	53
Leucocyte count ...	...	...	...	...	34
Differential leucocyte counts ...	...	...	...	...	6
Nonne Apelt globulin test ...	...	...	...	...	13

(e) *Pus, discharges and scrapings (Microscopical)*

Total number examined ...	...	...	...	...	13
Fungus ...	...	...	...	...	7
<i>Actinomyces hominis</i> ...	...	...	...	...	1
Count...	1
Differential count	1

(f) *Entomology*

Identification of mosquito	1
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II. PATHOLOGY

Morbid and histological examinations were made on 100 specimens of material.

HEAD :

<i>Brain</i> —Abscess ...	...	...	...	...	1
Malaria M. T. ...	...	...	...	...	2
Normal ...	...	...	...	...	1
<i>Nose</i> —Epithelioma ...	...	...	...	...	1
Chronic inflammation ...	...	...	...	...
<i>Eye</i> —Chalazion ...	...	...	...	...	1
<i>Tongue</i> —Haemangioma ...	...	...	...	...	1
Hypertrophy of surface of epithelium...	...	...	...	...	1
<i>Salivary</i>					
<i>Gland</i> —Normal ...	...	...	...	...	1
Mixed tumour of parotid ...	...	...	...	...	2
<i>Face</i> —Rodent ulcer ...	...	...	...	...	1
Granuloma of unknown origin ...	...	...	...	...	1
Squamous epithelioma ...	...	...	...	...	1

SKIN—

Infective granuloma ...	...	...	...	...	1
Fibroma ...	...	...	...	...	1
Plexiform angioma ...	...	...	...	...	1
Chronic inflammation ...	...	...	...	...	2
<i>Soft Tissues</i> :					
Chronic inflammation ...	...	...	...	...	1
Cellulitis ...	...	...	...	...	1

II. PATHOLOGY—*continued*

<i>Forearm.</i>						
Fibroma ...	...	...	...	...	...	1
<i>Shoulder :</i>						
Fibroma ...	...	...	...	...	...	1
<i>Breast</i> —Carcinoma ...	...	...	...	...	...	7
—Fibroadenoma	...	...	...	...	...	3
—Simple cyst	...	...	...	...	...	1
—Granuloma	...	...	...	...	...	1
—Abscess	...	...	...	...	...	1
—Norinal	...	...	...	...	...	2
<i>Aorta</i> —Atheroma ...	...	...	...	...	...	1
<i>Stomach</i> —M. T. malaria ...	...	...	...	...	...	1
<i>Abdominal Wall</i> —Fibrosarcoma ...	...	...	...	...	...	1
—Spindle-celled sarcoma	...	...	...	...	...	1
—Papilloma	...	...	...	...	...	1
<i>Intestines</i> —Adenocarcinoma ...	...	...	...	...	...	3
—Chronic inflammation	...	...	...	...	...	1
—Crohn's disease (Hyperthrophy of Ileum ?)	...	...	...	...	...	1
<i>Bladder</i> —Carcinoma ...	...	...	...	...	...	1
<i>Spleen</i> —M. T. malaria ...	...	...	...	...	...	2
<i>Liver</i> —M. T. malaria ...	...	...	...	...	...	2
<i>Nerve</i> —Neuroma ...	...	...	...	...	...	1
<i>Muscle Sheath</i> —Fibroma ...	...	...	...	...	...	1
FEMALE GENITALIA :						
<i>Uterus</i> —Hyperplasia of endometrium ...	...	...	...	...	...	2
Carcinoma of body	...	...	...	...	...	2
Carcinoma of cervix	...	...	...	...	...	3
Chronic cervicitis ...	...	...	...	...	...	1
Chronic epithelioma	...	...	...	...	...	1
Fibroma ...	...	...	...	...	...	2
Chronic inflammation	...	...	...	...	...	1
Cervical erosion ...	...	...	...	...	...	1
Products of miscarriage ...	...	...	...	...	...	2
<i>Ovary</i> —Leiomyoma ...	...	...	...	...	...	1
—Haemorrhage into atretic follicles	...	...	...	...	...	1
MALE GENITALIA :						
<i>Penis</i> —Hypertrophy of epithelium ...	...	...	...	...	...	1
<i>Leg</i> —Fibroma ...	...	...	...	...	...	1
<i>Knee-Joint</i> —Chronic inflammation	...	...	...	...	...	1
<i>Periosteum</i> —Chronic inflammation	...	...	...	...	...	1
<i>Feet</i> —Melanoma ...	...	...	...	...	...	1
<i>Lymph Gland</i> —Normal ...	...	...	...	...	...	3
—Tubercle bacilli ...	...	...	...	...	...	4
—Chronic inflammation	...	...	...	...	...	4
—Lymphsarcoma ...	...	...	...	...	...	2
—Secondary carcinoma	...	...	...	...	...	2
—Hodgkin's disease	...	...	...	...	...	1
<i>Bone</i> —Tubercle bacilli ...	...	...	...	...	...	1
—Chronic inflammation	...	...	...	...	...	3
—Sarcoma ...	...	...	...	...	...	1
—Osteochondroma ..	...	...	...	...	...	1

III.—BACTERIOLOGICAL

A. 731 MICROSCOPICAL EXAMINATIONS WERE MADE

(a) *Sputum. (Microscopical)*

Total number examined ...	...	...	...	...	584
<i>Mycobacter tuberculosis</i> ...	...	...	...	...	98
Pneumococci ...	...	...	...	...	2

(b) *Cerebro-spinal Fluid (Microscopical)*

Total number examined ...	...	...	...	...	21
<i>Neisseria meningitidis</i> ...	...	...	...	...	4
Pneumococci ...	...	...	...	...	6

(c) *Throat and Nasal Swabbings (Microscopical)*

Total number examined ...	...	...	...	...	36
<i>Corynebact diphtheriae</i> ...	...	...	...	...	11
Vincent fusiform organisms ...	...	...	...	...	4

(d) *Pus, Discharges, and Scrapings, etc., (Microscopical)*

Total number examined ...	...	...	...	...	89
<i>Neisseria gonorrhoeae</i> ...	...	...	...	...	14
Pneumococci ...	...	...	...	...	2
Streptococci ...	...	...	...	...	1
Staphylococci ...	...	...	...	...	1
Vincent fusiform organisms	1

(e) *Cow's Stomach (Microscopical)*

<i>Brucella abortus</i> (Bang)	1
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B. 2,400 CULTURAL EXAMINATIONS WERE MADE

(a) *Blood*

Total number cultured	53
<i>Bact. typhosum</i>	4
<i>Bact. coli</i> ...	...	...	...	...	1
<i>Bact. alkaligenes</i> ...	...	...	...	...	3
<i>Streptococci</i> ...	...	...	...	...	2
Staphylococci ...	...	...	...	...	5
Inoculation for rat bite fever ...	...	...	...	...	1

(b) *Faeces*

Total number cultured ...	...	...	...	...	323
<i>Bact. typhosum</i> ...	...	...	...	...	53
<i>Bact. flexneri</i> ...	...	...	...	...	2

(c) *Urine*

Total number cultured ...	...	...	...	...	217
<i>Bact. coli</i> ...	...	...	...	...	74
<i>Bact. coli (anaerogenes)</i> ...	...	...	...	...	6
<i>Bact. coli atypical</i> ...	...	...	...	...	10
<i>Bact. paracolon</i> ...	...	...	...	...	2
<i>Bact. alkaligenes</i> ...	...	...	...	...	6

Urine—contd.

<i>Pseudomona pyocyanea</i>	...	...	...	...	16
<i>Bact. proteus</i>	...	...	...	...	3
<i>Bact. typhosum</i>	...	...	...	...	2
Streptococci	...	...	...	...	30
Staphylococci	...	...	...	...	4
Inoculation to guinea-pig for <i>mycobacter tuberculosis</i>	...	...	...	...	3
Friedman's test for pregnancy	...	...	...	...	1

(d) Sputum

Total number cultured	...	...	...	...	5
Streptococci	...	...	...	...	3

(e) Cerebro-spinal Fluid

Total number cultured	...	...	...	...	31
<i>Neisseria meningitidis</i>	...	...	...	...	4
Pneumococci	...	...	...	...	2
<i>Bact. fr��dlander</i>	...	...	...	...	2
<i>H��mophilus influenza��</i> (Pfeiffer)	...	...	...	...	3

(f) Throat and nasal Swabbings

Total number cultured	...	...	...	...	1,291
<i>Corynebact. diphtheri��</i>	217
Diphtheroides	...	...	...	...	1
<i>Bact. fri��dlander</i>	...	...	...	...	1
Streptococci	...	...	...	...	37
Staphylococci	...	...	...	...	10
<i>M. tetragen</i>	...	...	...	...	1
Virulence test for <i>corynebact. diphtheri��</i>	1

(g) Pus. Discharges, and Scrapings, Etc.

Total number cultured	...	...	...	...	472
Staphylococci	...	...	...	...	196
Streptococci	...	...	...	...	5
<i>Bact. fri��dlander</i>	...	...	...	...	4
<i>H��mophilus influenza��</i> (Pfeiffer)	...	...	...	...	3
<i>B. paracolon</i>	...	...	...	...	1
<i>Bact. alkaligen</i>	...	...	...	...	3
<i>Bact. proteus</i>	...	...	...	...	2
<i>Bact. coli</i>	...	...	...	...	7
Inoculation to guinea-pig for <i>mycobacter tuberculosis</i>	1

(h) Cow's Stomach

<i>Brucella abortus</i> (Bang)	1
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C. AUTOGENOUS VACCINES WERE PREPARED FROM THE FOLLOWING
ORGANISMS ISOLATED, AMONG OTHERS, FROM VARIOUS
SAMPLES, 22 IN ALL

(a) <i>Blood</i>					
Staphylococci	...	...	...	...	1
(b) <i>Urine</i>					
<i>Bact. coli anaerogenes</i>	...	...	...	...	1
<i>Bact coli</i>	...	...	...	...	2
<i>Pseudomonas pyocyanea</i>	...	...	...	...	1
Streptococci	...	...	...	...	1
(c) <i>Sputum</i>					
Streptococci	...	...	...	...	2
(d) <i>Throat and Nasal Swabbings, Etc.</i>					
Streptococci	...	...	...	...	2
(e) <i>Pus, Discharges, and Scrapings, Etc.</i>					
Staphylococci	...	...	...	...	9
Streptococci	...	...	...	...	2
<i>Corynebact acnes</i>	...	...	...	...	1

D. Agglutination tests :

Significant agglutinins for <i>Bact. typhosum</i>	"H"	472
"	"O"	390
"	"Vi"	1
"	Proteus OX 19	7
"	OX k	2
"	OX 2	1
Unsuitable for test	...	28
Total number of sera submitted for agglutination tests	...	1,035

E. Water Analysis :

Number of samples examined	...	234
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F. Septic tank :

Number of samples examined	...	7
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G. Milk Analysis :

Number of samples examined	...	4
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IV. HAEMATOLOGY

Routine blood examinations

Total number examined	...	519
Full counts of red and white cells and haemoglobin determinations	...	243
Differential leucocyte counts	...	189
Blood picture	...	6
Blood typing	...	54
Clotting and bleeding times	...	7
Sedimentation rate	...	20

V. SEROLOGY

(a) *Blood*

Kahn test :

Negative	...	...	...	...	...	...	3,487
Doubtful reactions	...	...	...	...	...	...	456
+	...	...	...	...	...	...	486
++	...	...	...	...	...	...	948
+++	...	...	...	...	...	...	497
++++	...	...	...	...	...	...	84
Unsuitable for test	...	...	...	...	...	...	71
							<hr/> 6,029 <hr/>

(b) *Cerebro-spinal Fluid*

Negative	...	...	...	...	...	...	20
+	...	...	...	...	...	...	4
++	...	...	...	...	...	...	1
Unsuitable for test	...	...	...	...	...	...	3
							<hr/> 28 <hr/>

VI. LABORATORY PRODUCTS

Autogenous vaccines were prepared during 1947 ; details of which will be found under Bacteriology—

T. A. B. vaccine prophylaxis	...	...	...	52 litres
T. A. B. vaccine protein shock	...	...	...	900 c.c.
Besredka's staphylococcal antiviral	...	...	...	12 litres
Besredka's streptococcal antiviral	...	...	...	6 „

CONCLUSION

I should like to thank all members of the staff for their loyal co-operation throughout the year.

24th February, 1948.

A. NG CHHUNG-HIN,
Acting Senior Pathologist.

PUBLICATION

Tonking, H. D., Gebert, S. ; The use of D.D.T. Residual Sprays in the Control of Malaria over an area of 16 square miles in Mauritius. Colony of Mauritius, Publication No. 40, 1947.

ANNUAL REPORT OF THE BACTERIOLOGICAL LABORATORY FOR 1947

APPENDIX A

Annual Report of the Government Chemist for the year 1947

STAFF

Government Chemist : E. Collins, M.A. (Cantab), F.R.I.C. Assistant Government Chemist : R. Avice du Buisson, R.A.C. (Maur.)

Mr. Collins, the Government Chemist, was transferred to Hong Kong and left the Colony on the 11th September, 1947. The Assistant Government Chemist assumed the acting duties of the post and Mr. J. Hervel, Junior Laboratory Assistant of the Bacteriological section, was detailed to the Chemical section as Assistant.

During the year under review the volume of work showed slight increase as compared with the previous year : 3,935 samples were examined against 3,906 in 1946 and it was, generally speaking, practically of the same nature as that of last year. The analyses were distributed as follows :—Biochemical : 2,054, Public Health : 978, Customs and Excise : 552, Police : 264, Miscellaneous : 87.

A number of water samples have been tested at the request of Mr. Hamlin, an expert on a visit in this Colony during several weeks to investigate the question of sewage.

As to the character of the other analyses, the most interesting of which are those in connection with specimens and exhibits under the " Police " and " Miscellaneous " headings, nothing very original and outstanding was noticed this year, except that the proportion of alcohol estimation in blood, which is nearly always connected with motor car accidents, have been higher than during the preceding years.

The work detailed in this report does not give any indication of the extent of the laboratory's contribution to the community in an advisory capacity.

As in the past, this laboratory is asked to give advice on numerous occasions to other departments of the Government as well as to commercial firms and individuals in a variety of subjects of a scientific nature. The Government Chemist also attends various committees appointed to enquire on industries, etc.

Milk samples have been received at an unprecedented rate this year. This was due to the Milk Seller's Association which asked the help of Government to start a milk control on their behalf. But in view of the departure of Mr. Collins it was thought advisable to reduce the number of samples sent for examination. Even so the number of milk samples analysed this year was slightly greater than that of last year, which was considered a record : 911 with 80 per cent. adulterated this year and 906 with 81.5 per cent adulterated in 1946.

ANNUAL REPORT OF THE BACTERIOLOGICAL LABORATORY FOR 1947

APPENDIX B

Annual Report of the Civil Hospital Branch Laboratory
for the year 1947

Total number of Examinations : 8,573.

I. MEDICAL BIOLOGICAL

4,765 SIMPLE ROUTINE CLINICAL EXAMINATIONS WERE MADE

(a) *Blood (Microscopical)*

Total number examined ... 338

Films for malarial parasites :

Plasmodium malariae ... 1*Plasmodium vivax* ... 13*Plasmodium Falciparum* ... 37

Undetermined rings... 14

No parasites found ... 236

Films for microfilariæ :

Wuchereria bancrofti ... 3

No microfilariæ ... 34

(b) *Faeces (Microscopical)*

Total number examined : ... 2,577

Helminths :

Trichuris ova ... 333

Ascaris ova ... 142

" Hookworm " ova ... 810

Enterobius vermicularis ova ... 3*Heterodera radiculicola* ova ... 5

Tapeworm ova ... 3

Trichostrongyle ova ... 6

Strongyloides larvae ... 51

Protozoa :

Entamoebae histolytica ... 94*E. coli* ... 51

Vegetative and precystic entamoebae ... 97

Endolimax nana ... 20*Giardia intestinalis* ... 70*Chilomastix mesnili*... 25*Trichomonas intestinalis* ... 95*Blastocystis hominis*... 207

No helminths or protozoa ... 844

(c) *Urine (Microscopical)*

Total number examined : ... 1,850

Hyaline casts... 188

Granular casts ... 268

Waxycasts ... 36

Cellular casts... 43

Leucocytic casts ... 52

Red blood cells casts ... 24

Schistosomum haematobium ... 231*Trichomonas vaginalis* ... 64*Microfilariae* .. 1

II. BACTERIOLOGICAL

1,456 MICROSCOPICAL EXAMINATIONS WERE MADE

(a) *Sputum (Microscopical)*

Total number examined ...	...	...	...	...	1,038
<i>Mycobacter. tuberculosis</i> ...	...	...	...	...	202

(b) *Nasal and Throat Swabbings. (Microscopical)*

Total number examined ...	...	...	...	...	17
<i>Corynebact. diphtheriae</i> ...	...	...	...	...	2
Vincent's organisms ...	...	...	...	...	1

(c) *Pus, Discharges, etc. (Microscopical)*

Total number examined ...	...	...	...	...	401
<i>Neisseriae gonorrhoeae</i> ...	...	...	...	...	71

III. HAEMATOLOGY

Routine blood examinations.

Total number examined ...	...	...	...	...	506
Total counts of red and white cells and haemoglobin determinations ...	...	...	...	...	438
Differential leucocyte counts ...	...	...	...	...	68

IV. BIOCHEMICAL

(a) *Urine*

Total number examined ...	...	...	...	...	1,836
Quantitative estimations of Glucose ...	...	...	...	...	198
„ „ Albumen ...	...	...	...	...	65
Qualitative test for determination of Acetone	62
„ „ „ Bile	60

V. MISCELLANEOUS

Total number examined	10
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ANNUAL REPORT OF THE BACTERIOLOGICAL LABORATORY FOR 1947

APPENDIX C

Annual Report of the Victoria Hospital Branch Laboratory
for the Year 1947

Total number of Examinations : 4,887.

I. MEDICAL BIOLOGICAL

3,218 MICROSCOPICAL EXAMINATIONS WERE MADE.

(a) *Blood. (Microscopical)*

Films for malaria parasites :

<i>Plasmodium malariae</i> ...	...	...	...	4
<i>Plasmodium vivax</i> ...	...	...	...	14
<i>Plasmodium falciparum</i> ...	...	...	...	22
No parasites found ...	...	...	...	315

Films for microfilariae :

<i>Wuchereria bancrofti</i> ...	...	...	...	8
No microfilariae ...	...	...	...	58

TOTAL ... 421

(b) *Faeces. (Microscopical)*

Total number examined... 2,095

Helminths :

<i>Trichuris ova</i> ...	...	...	...	386
<i>Ascaris ova</i> ...	...	...	...	154
'Hookworm' ova ...	...	...	...	553
<i>Strongyloides larvae</i> ...	...	...	...	11
<i>Heterodera radiculicola ova</i> ...	...	...	...	7
<i>Enterobius vermicularis ova</i> ...	...	...	...	5
<i>Trichostrongyle ova</i> ...	...	...	...	1

Protozoa :

<i>Entamoebae histolytica</i> ...	...	...	...	34
<i>Entamoebae coli</i> ...	...	...	...	8
Vegetative and precystic entamoebae ...	...	...	...	18
<i>Iodamoeba butschlii</i> ...	...	...	...	1
<i>Giardia intestinalis</i> ...	...	...	...	33
<i>Chilomastix mesnili</i> ...	...	...	...	3
<i>Trichomonas intestinalis</i> ...	...	...	...	8
No helminths or protozoal parasites ...	...	...	...	742

(c) *Urine. (Microscopical)*

Total number examined ... 702

Hyaline casts ...	...	...	...	11
Blood casts ...	...	...	...	1
Leucocyte casts ...	...	...	...	18
Granular casts ...	...	...	...	226
<i>Schistosoma haematobium</i> ...	...	...	...	58
<i>Trichomonas vaginalis</i> ...	...	...	...	14

II. BACTERIOLOGICAL

471 MICROSCOPICAL EXAMINATIONS WERE MADE.

(a) *Sputum.* (Microscopical)

Total number examined	...	...	...	...	307
<i>Mycobacter tuberculosis</i>	...	...	...	...	47

(b) *Nasal and Throat Swabbings.* (Microscopical)

Total number examined	...	...	...	...	15
Streptococci	...	...	...	...	1

(c) *Pus, Discharges, Etc* (Microscopical)

Total number examined	...	...	...	...	149
<i>Neisseriae genorrhoeae</i>	...	...	...	...	21

III. HAEMATOLOGY

Routine blood Examinations.

Total number examined	...	...	...	...	779
Total counts of red and white cells and haemoglobin determinations	...	...	...	...	614
Differential leucocyte counts	165

IV. BIOCHEMICAL

(a) *Urine*

Total number examined	419
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ANNUAL REPORT OF THE BACTERIOLOGICAL LABORATORY FOR 1947

APPENDIX D

Report on the Work of the Division of Entomology

INTRODUCTION

Following the creation of a malarial engineering branch, the Entomologist, who since 1929 had been the initiator as well as the executor of all anti-malaria works in the central part of the island, and who also during war years worked for the Admiralty, was able, at last, to revert to his original duties and to devote the whole of his time to Entomology.

When Dr. H. D. Tonking, the Senior Pathologist, who at the Director's request, was acting as co-ordinating officer for the D.D.T. Campaign, offered me accommodation at the Central Laboratory, his offer was gladly and gratefully accepted as it was realized that close contact with the facilities of a Central Laboratory was essential to efficient entomological control of any anti-malarial works.

Thus the deficiencies in the entomological branch were made good at the expense of the staff of the Central Laboratory. In this respect, I wish to thank the personnel for their heartfelt cooperation.

My thanks also go to all members of my staff for their very efficient cooperation.

*Mosquito Surveys before and after the Application of D.D.T.
Savannah-Mahebourg Area*

As most of the research work carried out was in connection with D.D.T. residual spray in dwellings, this subject will be dealt with first.

After the spraying of the Bambous-Medine-Flic-en-Flac area, it was decided to continue experimenting with D.D.T. but on a much large scale. For this purpose, the eastern part of Grand Port district was chosen. This area lies between a line, running parallel with the Savannah-Plaine Magnien main road and thence straight to Mt-des-Créoles, and the sea. It is bounded on the North by Riviere-des-Créoles whilst its south-western end is closed by Rivière du Poste. Savannah Sugar Estate was included in the area. Before the application of D.D.T. a mosquito survey of this area was made.

Work in the Zone was started at Savannah on May 7th last, and was ended at Pointe Brocus village on August 9th. Pte-d'Esny village was done between August 12th and 19th.

The general routine adopted for ascertaining whether mosquitoes are present in habitations is as follows :—On entering a dwelling, the floor and immoveable furniture are covered with lengths of white calico all openings are then closed and the interior is sprayed with 1 in 20 "Pyagra" concentrate. After 15 minutes, the doors and windows are opened, and the insects fallen on the calico are counted.

The following table shows the number of rooms treated and the number of mosquitoes collected. Owing to the small staff available, it has not been possible to search all the dwellings in the area. I have therefore chosen those in the vicinity of former potential, or known breeding-places. Each dwelling was entered once only.

CENSUS OF THE ADULT MOSQUITO POPULATION IN THE DWELLINGS OF THE EASTERN PART
OF GRAND PORT DISTRICT BETWEEN THE MONTHS OF MAY AND AUGUST 1947

		Number of Blocks searched	Number Rooms in blocks	Number of adult mosquitoes found :					
				<i>A. funestus</i>		<i>A. gambiae</i>		<i>C. fatigans</i>	
				♀	♂	♀	♂	♀	♂
Savanah Sugar Estate...	...	68	359	430	5	14	—	8,047	2,753
La Sourdine Village ...	...	78	159	415	10	11	—	1,960	292
L'scalier Village ...	...	53	106	6	—	7	—	560	167
La Baraque Sugar Estate ...	...	22	125	92	5	3	—	1,310	230
Malakoff Village ...	...	16	31	1	—	—	—	179	15
Savinia (Souffleur) Sugar Este.		9	10	88	13	1	—	82	9
Plein Bois Village ...	...	12	37	—	—	—	—	226	30
Virgina Sugar Estate ...	...	9	20	79	4	4	—	94	10
Carreau Cassia Village ...	...	27	44	154	1	14	—	261	30
Trois Boutique Village ...	...	4	7	1	—	—	—	30	3
Mon Desert Estate ...	...	5	18	35	—	—	—	77	0
Ilot Brocus ...	...	2	5	—	—	—	—	—	—
Sauveterre Sugar Estate ...	...	18	38	104	2	4	—	185	23
Beau Fond Estate ...	...	8	13	5	—	2	—	39	5
Union Vale Sugar Estate ...	...	29	146	2,723	170	523	2	257	19
Camp Esnouf Village ...	...	15	34	2,785	136	432	—	70	3
Plaine Magnien Village ...	...	35	82	3	—	3	—	252	9
Solitude (Morel) Village ...	...	22	42	3	—	—	—	169	22
Beau Vallon Sugar Estate ...	...	30	115	—	—	—	—	771	171
Carreau Manioc ...	...	17	32	—	—	—	—	118	41
Bois d'Oiseaux (Allée Gheude)...		8	18	—	—	—	—	139	39
Barachois Region ...	...	7	17	—	—	—	—	—	—
Le Quartier ...	...	6	18	—	—	—	—	131	30
Ville Noire ...	...	10	30	—	—	—	—	134	41
Petit Bel Air Village ...	...	6	10	1	—	1	—	11	—
Riv. des Creoles Village ...	...	6	13	11	2	1	—	28	1
Pte. Brocus Village ...	...	70	142	92	—	—	—	554	43
Bon Espoir Village ...	...	13	23	116	17	—	—	46	—
Pte. d'Esny Village ...	...	50	183	—	—	2	—	21	—
		635	1,877	7,144	365	1,022	2	15,751	3,986

Proportions of *A. funestus* to *A. gambiae* = 7 : 1

Two months after D.D.T. treatment, some of the habitations, which showed the greatest number of anophelines before spraying with D.D.T. were again searched. The numbers of mosquitoes before and after D.D.T. are tabulated below—

		Before D.D.T.		After D.D.T.	
		From 3.9.47 to 23.9.47		From 3.9.47 to 23.9.47	
		<i>A. funestus</i> and <i>A. gambiae</i>	<i>C.</i> <i>fatigans</i>	<i>A. funestus</i> and <i>A. gambiae</i>	<i>C.</i> <i>fatigans</i>
Savannah ...	...	305	5,639	0	162
La Sourdine ...	...	204	337	0	0
Virginia ...	...	91	104	0	0
Union Vale Estate ...	...	3,379	68	0	14
TOTAL ...		3,979	6,148	0	176

It will be seen that 3,979 anophelines were found before the application of D.D.T. and none after.

The work in this area is being continued.

Bambous-Flic-en-Flacq area

Investigations in this block were begun in June 1946 and are still continuing. After the preliminary survey, the dwellings—human and animal were treated with D.D.T. The results of this work are embodied in a Central Laboratory Publication ⁽¹⁾.

Chamarel

A mosquito census of Chamarel village was made during the month of May, before the application of D.D.T. Three months after, another survey was made; no anophelines were found in the houses. This was followed by another application of D.D.T. and a second survey with the same results. See the following table.

No. of dwellings searched : 46
No. of rooms in them : 97

No. of mosquitoes found

			Before D.D.T.	After 1st Appli- cation	After 2nd appli- cation
A. funestus	...	...	790	0	0
A. gambiae	...	...	3	0	0
C. fatigans	...	...	121	0	54

MOSQUITO SURVEYS IN OTHER PARTS OF THE ISLAND

The Savane District

Entomologically this part of the island was relatively unexplored. It was anticipated that searches in the district would prove of interest. On the 15th of October, a house-to-house survey was started at Baie-du-Cap which was included in the zone, and, up to the time of writing, Chemin-Grenier has been reached. As had been hoped this area yielded rich returns; and on the 14th of November *A. melas* was found for the first time in Mauritius, in the village of St. Martin. A few days later, in the same village, another mosquito, new to the island, a species of *Mansonioides* was discovered.

The preponderance of *A. funestus* over other species was also noted.

General Research

Since the use of D.D.T., a general improvement in the well being of the inhabitants in the treated areas of Black River is apparent. The residents in that part which has been under D.D.T. for over eighteen months say that they no longer suffer from malaria. The continuation of this work will either prove or disprove the efficacy of D.D.T. spraying.

From the entomological aspect, one fact stands out, which is that treated houses, some of which used to show as many as two thousand anophelines per room in day-time "knock downs" do not now produce a single anopheline. The failure to find resting anophelines during the day does not however mean that the insects do not enter at night. The night movements of anophelines are being investigated. Experiments have been started with mosquito traps placed against windows at night, but they have unfortunately had to be abandoned owing to lack of staff.

Experiments in the partial spraying of dwellings with D.D.T. have been made. The results obtained were very satisfactory and have formed the subject of a communication, now in print ⁽²⁾. Briefly, it was demonstrated that it is not necessary to spray the whole of a house. Spraying of a bedroom only, and possibly only the walls forming the angle in which the bed lies, proved sufficient.

During investigations in the Black River District larvæ of a species of *Mucidus*, of which I had discovered a single specimen several years ago, were obtained. These were bred in the laboratory and the resulting adults proved to be new to science. I have described it under the name of *Mucidus tonkingi* ⁽³⁾ in recognition of the encouragement and support that I received from Dr. H. D. Tonking and without which this fruitful experimental work would have been impossible.

Efficiency of anti-malaria works in the Mahebourg Area

During the war, I planned and carried out extensive anti-malaria works in and around the town of Mahebourg. These comprised the abolition of the series of marshes which were on both banks of River La Chaux between Beau-Vallon and the estuary. The larger expanses were a little above and just below the bridge, that is in the centre of the region, and used to breed *A. funestus*, in large numbers, as well as a lesser proportion of *A. gambiae*.

Since the completion of the works, Mr. H. Parcou—the Controller in the area—who also took part in the original works, has kept them in a perfect state of maintenance, with the following results—

- (1) A mosquito survey made in July 1947 showed no anophelines in houses in the area.
- (2) Examination of blood films of 999 persons including 12 children from the Government School, taken in September and December 1947, gave a parasite index of 1% whilst the figure for the Admiralty Survey made in September 1942, before the works were started, is 30.96%.

Future Programme

During 1948, the survey of the Savane district will be completed. The rest of Grand Port might then be done and, if additional staff is available, a mosquito census and survey of the rest of the island could be started together with day and night trapping.

Investigations on the effect of D.D.T. on the anopheline population of a treated area will be pushed further. So as to ascertain what takes place in the huts after dark, night catches and "knock downs" will be made.

Routine entomological control of D.D.T. application will be continued.

PUBLICATIONS

- (1) Tonking, H. D., Gebert, S. (1947). The use of D.D.T. Residual Sprays in the Control of Malaria over an area of 16 square miles in Mauritius. Col. of Mauritius Pub. No. 40, 1947. Govt. Printer.
- (2) Gebert, S. Notes on Certain Aspects of the Action of D.D.T. Residual Sprays and on the Partial Treatment of Dwellings as a means of Anti-Anopheline Protection (in print). Trans. R. Soc. Trop. Med. Hyg.
- (3) Gébert, S. Notes on a New Species of *Mucidus* (in print). The Entomologist.

S. GÉBERT,
Entomologist.

8th March, 1948.

APPENDIX II

Experiments in the Control of Malaria

BLACK RIVER DISTRICT

Black River, the most highly infected area in the Colony was selected for experimental work in 1947. Four villages were chosen and, for each, one or more measures of control were instituted. It is not possible here to give a detailed account of this work but the following facts will be of interest :

(i) *Chamarel*.—A village 1,000 ft. above sea level some two miles from the coast with a population of 390. *A. funestus* breeds in numerous streams. Preliminary surveys were carried out in May 1947. Two methods were employed—spraying interior surfaces of all buildings with a 4·6 per cent. solution of D.D.T. in Kerosene and daily administration under supervision to all inhabitants of one tablet of Paludrine (100 mg.) or one half-tablet to children under five years of age.

(ii) *Grande Riviere Noire*.—With a population of 520 is situated on the coast. Prolific breeding of *A. funestus* and *A. gambiae* occurs in the Black River, the Mi-voie Canal and *A. gambiae* breed freely in marshes and seepages. The spleen index in children in the 2–9 age group was found to be 100 per cent. Here the method adopted was attack on larvæ by means of a D.D.T. 5 per cent., Resin 0·25 per cent. and oil to 100 per cent.

(iii) *Petite Riviere Noire Estate*.—Situated at sea level has as its main vector *A. gambiae*. Owing to the drought in 1947 malaria transmission here was less in 1947 but in 1943 the spleen index of children on the estate was 100 per cent.

In this case the effect of chloroquine as a prophylactic is being treated in weekly doses of 0·25 gramme to adults, 12 cts to children between 5 and 10 years and 0·06 gramme to children between 2 and 5 years.

The drug is administered by the manager of the estate in person.

(iv) *Baie du Cap Estate (Staub)*.—500 ft. above sea level, is at the southern extremity of Black River district. The population was 176 on 21st November. The spleen index on that date for all ages was 61 per cent., 2–9 age group 76 and 10–14 group 85·7.

Here prophylaxis is being tried by paludrine administered twice weekly under supervision of the manager.

Control villages have been selected for purposes of comparison.

The experiment at the Mental Hospital to which reference was made in the report for 1946 was completed. Paludrine and S.N. 7618–5 were administered to patients in weekly doses of 0·1 gm and 0·25 gm respectively. The results of blood examinations are shown in the following table—

Date	27.11.46 and 2.12.46			3.3.47			9.6.47		
	Total Examined	Parasite Index	Carrier Rate	Total Examined	Parasite Index	Carrier Rate	Total Examined	Parasite Index	Carrier Rate
Control ...	196	9·7%	0·51%	192	2·6%	1·04%	182	4·95%	1·1%
Paludrine ...	195	5·64%	Neg :	192	Neg :	Neg :	172	1·74%	0·58%
S N 7618–5...	200	5·74%	Neg :	188	Neg :	Neg :	158	Neg :	Neg :

APPENDIX III

Report on Nutrition work for 1947

1. *Training*.—Six domestic science teachers of the Training College have been given a course in theoretical and practical nutrition work. The course lasted for about six months, and included practical work in hospitals, infirmaries, schools and welfare centres. Five of the students spent at least a fortnight in each type of institution and were shown every side of the feeding arrangements from buying to distribution. They have had experience in carrying out survey work in institutions and four of them spent a week in residence at the school feeding centre, and have visited schools to take height weight measurements of the children. They have also given simple lectures (in Creole) in mothercraft, child care and feeding at several Child Welfare Centres. These talks were very well received, a great many of the mothers not only taking an interest at the time, but also asking for the talks to be repeated.

This course finished in August. Since then two of the students have returned to the Training College to teach domestic science ; one has obtained the post of Labour Inspector at the Labour Department where her practical experience should be very useful ; one has been acting as an assistant in nutrition work ; and the other two have been temporarily returned to schools. They have been released by the Education Department for a short time to assist in a survey which is now being carried out in Bambous.

2. *Food Supplies*.—(i) A “ balance sheet ” of the total food supplies of the island in 1946 was drawn up and has been repeated for 1947. This “ balance sheet ” indicates the extent to which total supplies are adequate. It does not show how consumption varies in different sections of the population, but can be used as a starting point for planning a food programme, since it can be assumed that when there are gross deficiencies in total supplies on a “ per head of the population ” basis, these deficiencies will be more marked in the poorer sections of the population.

(ii) In general the picture for 1946 and 1947 is similar, and the following are the main conclusions—

- (a) Owing to lack of accurate information about the local production of foodstuffs, particularly fresh fruits and vegetables, it is not possible to gain a completely accurate picture of the situation. It is not possible to say how far the food factors particularly affected by the consumption of fruits and vegetables (i.e., vitamins A and C) are adequate. The exclusion of figures for these foods also affects other food factors to some extent, but making allowances for this, it is still possible to estimate the main deficiencies.
- (b) There is an over-all deficiency of vitamins of the B—group, good quality protein, and calcium in particular, and of all other factors to some extent.
- (c) A very high proportion of the total Calories is supplied by sugar (up to 30%), which even in the case of raw sugar should be regarded as an energy food only.
- (d) The foods that might be increased in order to make good the deficiencies are pulses, groundnuts and animal foods firstly, and cereals starchy roots and oils to a lesser extent.

(iii) A report was submitted early in 1947 and an attempt made to draw up a minimum import programme in accordance with the needs of the population. This was considered by the Departments of Health, Agriculture and Supplies, and the following conclusions were reached—

- (a) While the world supply position remained so uncertain it would probably not be possible to increase the imports of cereals and oils any further than was already being done.
- (b) The emphasis should be laid on concentrated foods to supplement the main deficiencies, in particular on dried and salt fish and yeast. The amount of dried and salt fish available for consumption in 1947 has increased to 32 grms per head per week from 13 grms per head per week in 1946.

The question of supplying food yeast to the population is now being considered. In addition to the local production of yeast tablets, 5 million food yeast tablets have been imported from Jamaica and are being sold through retailers at a low cost, evidently with success.

The extent to which food yeast powder can be incorporated in foods generally consumed is being investigated. It is unfortunately impossible at present for practical reasons, to add the yeast to flour before distribution from the Granary, but 300 lbs of the powder has been received from Jamaica and is being tried out in various foods.

3. *Feeding in Poor Law Institutions.*—All the institutions have been visited several times, four typical institutions were chosen, and a survey of a fortnight's duration carried out in each. The results showed that at the time of the surveys the diet in all cases was inadequate in all respects, the average calorie intake being 1,760 per day, and the average B-vitamin intake being in all cases less than half and in some cases less than a third of the daily requirement. The average cost per head per day of the diet was 53 cents. One of the reasons for this low standard was lack of money, and lack of knowledge on the part of those in charge as to the best foods to buy.

A report was submitted to the Department concerned pointing out the inadequacy of the food, particularly in respect to children. A committee was appointed to make recommendations, and a diet and menu sheets were drawn up for babies, children and adults. Previously, money grants for feeding children have been less than for adults.

It was recommended that this diet scale be adopted by all the Institutions, and that the money spent on children should be at least equal to that spent on adults, owing to their higher requirements for the more expensive protective foods. It was agreed that the grant for children should be increased to 30 cents per head for food alone.

This money has now been made available for children, and a similar increase is expected for adults. The new diet scale has been adopted, and periodical visits are made to the Institutions to see how this is being put into practice.

In addition a course of six lectures and demonstrations in simple nutrition and cookery has been given to those in charge of these institutions.

4. *School Meals.*—The feeding of 1,600 children in the Grand Port area with a cooked midday meal has been continued. This meal was started as an experiment, and it was felt that the evidence available at the beginning of the year was not sufficient to justify a definite decision as to whether the

meal should be discontinued or extended. Since then suitable control schools have been chosen, and all the children have been periodically weighed and measured, and have been medically examined by the Health Officer of the Education Department. The results indicate that children receiving the meal (which is a substitute for a meal they would otherwise get in their homes) do benefit from it, but that this benefit is not so large as to justify the considerable expense entailed in extending it to all schools. The original meal supplies the following nutrient per child per day—

Calories	...	...	...	...	511
Protein	...	...	...	...	8 gms
Calcium	...	...	...	...	158 mgs
Iron	...	...	...	...	2.1 mgs
Vitamine A	...	...	...	...	1315 I.U
Aneurin	...	...	...	...	0.22 mgs
Riboflavine	...	...	...	...	0.12 „
Nicotinic acid	...	...	...	...	1.15 „
Vitamin C	...	...	...	...	16 „
<i>Rs. c</i>					
Cost per head per day	...	...	...	...	17
Cost per child (all schools)	...	...	...	...	1½ million rupees

This meal is capable of considerable improvement, and for a period of about three months, starting in January 1948, it is to be increased by the addition of more vegetables, and protein containing foods. There is little doubt that this will considerably improve the health of the children, but the cost of providing this improved meal to all schools would be in the region of three million rupees a year.

It is accepted that it would be ideal to provide all school-children with a well balanced meal at school, but it would be more practical to give some food that by being cheaper and easier to handle could be extended to more children in a shorter time, and which would concentrate in supplying those factors most likely to be deficient in the child's home diet (i.e. protein of good quality, calcium and the B vitamins).

Accordingly a 'Snack' meal has been devised, consisting of a milk drink, wheat-meal biscuits and yeast tablets. This is additional to a child's home food, and it is given at a time that does not coincide with the normal meals. It supplies the following nutrients per child per day—

Calories	...	...	...	...	135
Protein	...	...	...	...	8 gms
Calcium	...	...	...	...	240 mgs.
Iron	...	...	...	...	1 „
Vitamin A	...	...	...	...	16 I. U.
Aneurin	...	...	...	...	0.24 mgs.
Riboflavine	...	...	...	...	0.36 „
Nicotinic acid	...	...	...	...	0.64 „
Cost per head per day	...	...	...	...	5 cents
Cost per year for all schools	: Half million rupees				

This snack is now being given to a thousand children. Control Schools have been chosen, and the children have been medically examined, weighed and measured. It is expected that it will be possible to estimate the benefit to the health of the children by June, 1948 at the latest.

5. *Mental Hospital*.—Owing to the high incidence of pellagra in this hospital an investigation into the feeding was carried out. Examination of the diet sheet showed that the diet on paper was not grossly inadequate, and it was thought advisable to investigate more thoroughly and to see whether in fact the patients were receiving the food specified, and whether preparation and cooking methods were such as to cause a considerable loss in nutrients.

Two weeks were spent at the hospital and records were kept of all food from before cooking to serving. The patients' meals were weighed daily as they were given out. While it is possible that the presence of outside investigators might have influenced those responsible for preparing the food, comparison of this fortnight's food with past menus, and separate questioning of the patients showed that no significant changes were made in the main foods given.

The results indicate that while the diet is capable of improvement, it is not sufficiently inadequate to account for the outbreak of pellagra on the grounds of straightforward food deficiency alone. It still remains to be discovered whether the survey results did not give a true picture of the normal diet, or whether there is some factor interfering with absorption of nutrients, or some other unknown factor causing the pellagra.

Miscellaneous

1. Apart from the examination of School children the Orphanages have been visited and the children examined. In general there is a high incidence of minor signs of deficiency of the B—vitamins, and the children are poorly developed in comparison with children of the West Indies. The orphanages are now being supplied with local yeast tablets.

2. Apart from the lectures already mentioned, lecture courses have been given to Social Welfare workers and to Sanitary Inspectors.

3. A collection of local recipes and cooking methods is being made, and of all local foods that have not been analysed. These are being sent to the Nutrition Unit in London for comparison with other territories. It is hoped to compile a collection of analyses that can be applied directly in Mauritius.

J. C. CHETTLÉ

APPENDIX IV

DEPENDENCY OF RODRIGUES

The island sustained great devastation by four cyclones in a month, followed by a scanty rainfall, so that food crops could be grown on a very small scale.

Fortunately imported food supplies were regularly available and destitution was minimised by the distribution of money grants and relief work, by Government or from charitable sources.

Altogether the standard of nutrition was good. Many cases of Avitaminosis have been noted and one death from polyneuritis (wet type) occurred.

The housing conditions have steadily improved, although overcrowding still exists in almost every household.

In addition to the usual seasonal diseases such as dysentery, enteritis and influenza, there was an epidemic of mumps and an outbreak of chicken pox.

The lack of bathing and washing facilities, ignorance, bad housing conditions have contributed to the persistent spreading of scabies despite full medical assistance. Great misery to children and hardship to parents were thereby caused.

A new hospital dispensary has been built at La Ferme and will be opened to the Public in February next.

HOSPITALS AND DISPENSARIES

Port Mathurin Hospital.—A refrigerator, oil operated, is now in use for the storage of perishable medicines and ice-making. This building has undergone essential repairs. Sitting accommodation for out-patients has been increased. An urgent appeal has been made to the Magistrate for the construction of an independent maternity unit in the hospital premises. This has been approved by Government and the building is expected to be ready in June 1948. At Port Mathurin Hospital there were 265 admissions with 14 deaths and at Mont Lubin Hospital 85 admissions with 11 deaths.

The principal causes of admission were :

Diseases of the Alimentary System	...	...	...	...	47
„ Respiratory	...	...	...	...	23
„ Cardio-vascular	...	...	...	...	8
„ Genito-urinary	...	...	...	...	59
„ Nervous	...	...	...	...	6
„ Skin and Cellular tissue	...	...	...	...	43
„ Venereal disease	...	...	...	...	10
„ Blood and blood forming organs	...	...	...	...	12
„ Dysenteries	...	...	...	...	37
„ Injuries	...	...	...	...	99

15 patients were transferred to Mauritius for treatment.

Attendances at dispensaries were—

Port Mathurin	...	...	11,973
Mont Lubin	...	...	14,255

POPULATION

The population is estimated at 12,000. There were 532 births, making a live birth rate of 44 per 1,000.

Deaths.—253 deaths were registered including 14 Still Births and 6 deaths by violence. The death rate was 19·83 per 1,000.

FOOD INSPECTION

Meat inspection was carried out on all animals slaughtered at the Abattoir of Port Mathurin and revealed no communicable diseases. The carcase of an ox slaughtered outside the Port was produced by the Police for examination and found unfit for human consumption

DOMICILIARY VISITS

All visits were located in an around Port Mathurin, and nights calls were infrequent. Outside the Port, the chief emergencies were midwifery cases which were invariably carried to Hospital. Most pregnant mothers were advised to undergo a routine antenatal examination so as to avoid any unnecessary risks which the lack of qualified assistance or adverse domestic conditions may entail during confinement at home, by their timely admission into hospital.

SANITATION

In Port Mathurin Night Soil Service and Meat Inspection (for oxen) were satisfactory. The scavenging service was inadequate. Outside the Port, domestic sanitation is very poor, especially conservancy.

GOVERNMENT SCHOOL

The primary school in Port Mathurin was visited in July, just after the outbreak of mumps. As the school closed down shortly after for the winter holiday, so the disease had less chances of transmission. The standard of health and cleanliness of the pupils was good. Numerous cases of scabies were found and given free treatment and advice.

The **W.C.** (bucket type) were not sufficiently flyproof and certain structural alterations were suggested.

H.M. PRISONS

A weekly inspection of prisoners for skin and venereal diseases was held

POLICE

4 P.Cs reported sick.

